Due (either a paper copy or email attachment submission) on Sept. 20 by 12:05pm

If you need help with scanning your documents so that they may be submitted via email, please consider the following tools/references:
- Office Lens (Microsoft)
  - https://itunes.apple.com/us/app/office-lens/id975925059?mt=8 (iOS)
  - https://play.google.com/store/apps/details?id=com.microsoft.office.officelens&hl=en (Android)
- Review of app options: http://lifehacker.com/five-best-mobile-document-scanning-apps-1691417781
- One scanning option I have found easy to use: https://itunes.apple.com/us/app/doc-scan-scanner-to-scan-pdf/id453312964?mt=8 (iOS)

1. Suppose you have a production function of the form $Y = AK^{\alpha}N^{\beta}$.
   a. Suppose $\alpha = 0.25$ and $\beta = 0.5$. Demonstrate whether the function is a constant returns to scale production function. If not, what type is it? Demonstrate or explain.
   b. Suppose $\alpha = 0.75$ and $\beta = 0.5$. Demonstrate whether the function is a constant returns to scale production function. If not, what type is it? Demonstrate or explain.
2. Suppose you have two economies. In each, A = 1, k = 1, d = 0.05, and s = 0.1. In the first, $\alpha = 0.25$ while in the second $\alpha = 0.5$. Show the growth outcomes for each of the next 3 periods. What is the steady state level of output for each?
3. Suppose you have a production function of the form $Y = AK^{\alpha}N^{\beta}$.
   a. Suppose $\alpha = 0.25$ and $\beta = 0.75$. If A = 1, what is the per capita production function? Derive.
   b. Suppose $\alpha = 0.5$ and $\beta = 0.5$. If A = 10, what is the per capital production function? Derive.
4. Suppose disaster hit an economy such that its capital stock per worker fell by 10%. What is the implication of this negative shock for the short-run growth of the economy? What is the implication of this negative shock for the steady state level of output for the economy?
5. In 1979, China began the implementation of the one-child policy. Using the Solow model, explain the logic of slowing population growth as a tool to increase the rate of growth. What is likely missing from this conclusion? Explain.
6. Sometimes politicians suggest tax reductions on savings as a method for increasing the rate of growth. Using the logic of the Solow model, explain how such a tax system change could encourage growth.
7. Suppose you have an economy characterized by $y = 3k^{0.5}$, s = 30%, d = 10%, and n = 5%.
   a. What is the steady state level of consumption?
   b. How would consumption change at the steady state if the savings rate increased from 30% to 40%?
   c. Using the initial values (s = 30%), what is the steady state level of consumption if population growth increases to 8%?
8. Using data, explore the idea of "convergence" using the United States, Japan, and China as representative countries. How robust does the idea appear to be? Data on GDP and growth for these countries may be found at http://databank.worldbank.org/data/home.aspx.